

WHAT IS CLAIMED IS:

1. A polyethylene film having good barrier properties comprising a film prepared by forming a modified polyethylene polymer into a film, wherein the modified polyethylene polymer is prepared by treating a polyethylene polymer having an MI 2.16 of from about 0.10 to about 7.0 and a polydispersity of from about 3 to about 7 to increase long chain branching by an amount sufficient to decrease the rate at which water vapor passes through a film of the modified polyethylene polymer as compared to a similar film of the unmodified polyethylene polymer.
2. The polyethylene film of Claim 1 wherein the modified polyethylene polymer is prepared by admixing the polyethylene polymer with from about 10 to about 150 ppm of a peroxide free radical initiator and extruding under extrusion conditions sufficient to increase the long chain branching of the polyethylene polymer.
3. The polyethylene film of Claim 1 wherein the modified polyethylene polymer is prepared by admixing the polyethylene polymer with air and extruding under extrusion conditions sufficient to increase the long chain branching of the polyethylene polymer.
4. The polyethylene film of Claim 1 wherein the modified polyethylene polymer is prepared by admixing the polyethylene polymer with at least one additional polyethylene polymer wherein the at least one additional polyethylene polymer has a higher level of long chain branching than the polyethylene polymer.

5. The polyethylene film of Claim 1 wherein the MI 2.16 is from about 0.30 to about 5.0.

5 6. The polyethylene film of Claim 5 wherein the MI 2.16 is from about 0.70 to about 3.0.

7. The polyethylene film of Claim 1 wherein the polyethylene polymer is a Ziegler/Natta catalyzed polyethylene polymer.

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8. A process for preparing a polyethylene film having good barrier properties comprising preparing a modified polyethylene polymer by treating a polyethylene polymer having an MI 2.16 of from about 0.10 to about 7.0 and a polydispersity of from about 3 to about 7 to increase long chain branching by an amount
15 sufficient to decrease the rate at which water vapor passes through a film of the modified polyethylene polymer as compared to a similar film of the unmodified polyethylene polymer, and forming a film of the modified polyethylene.

9. The process of Claim 8 wherein the modified polyethylene polymer is
20 prepared by admixing the polyethylene polymer with from about 10 to about 150 ppm of a peroxide free radical initiator and extruding under extrusion conditions sufficient to increase the long chain branching of the polyethylene polymer.

10. The process of Claim 8 wherein the modified polyethylene polymer is
25 prepared by admixing the polyethylene polymer with air and extruding under extrusion conditions sufficient to increase the long chain branching of the polyethylene polymer.

11. The process of Claim 8 wherein the modified polyethylene polymer is prepared by admixing the polyethylene polymer with at least one additional polyethylene polymer wherein the at least one additional polyethylene polymer has a higher level of long chain branching than the polyethylene polymer.

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12. The process of Claim 8 wherein the MI 2.16 is from about 0.30 to about 5.0.

13. The process of Claim 12 wherein the MI 2.16 is from about 0.70 to about 3.0.

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14. The process of Claim 8 wherein the polyethylene polymer is a Ziegler/Natta catalyzed polyethylene polymer.

15. The process of Claim 8 additionally comprising forming the film into a packaging film.

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16. The process of Claim 9 wherein the packaging film is selected from the group consisting of food packaging, fragrance and fragrance-impregnated products packaging, photographic film packaging, medical application packaging, and agricultural product packaging.

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17. A modified polyethylene polymer useful for preparing films having good barrier properties comprising a modified polyethylene prepared by treating a polyethylene polymer having an MI 2.16 of from about 0.10 to about 7.0 and a polydispersity of from about 3 to about 7 to increase long chain branching by an amount sufficient to decrease the rate at which water vapor passes through a

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film of the modified polyethylene polymer as compared to a similar film of the unmodified polyethylene polymer.

18. The modified polyethylene polymer of Claim 17 wherein the modified
5 polyethylene polymer is prepared by admixing the polyethylene polymer with
from about 10 to about 150 ppm of a peroxide free radical initiator and extruding
under extrusion conditions sufficient to increase the long chain branching of the
polyethylene polymer.

10 19. The modified polyethylene polymer of Claim 17 wherein the modified
polyethylene polymer is prepared by admixing the polyethylene polymer with air
and extruding under extrusion conditions sufficient to increase the long chain
branching of the polyethylene polymer.

15 20. The modified polyethylene polymer of Claim 17 wherein the modified
polyethylene polymer is prepared by admixing the polyethylene polymer with at
least one additional polyethylene polymer wherein the at least one additional
polyethylene polymer has a higher level of long chain branching than the
polyethylene polymer.

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21. The modified polyethylene polymer of Claim 17 wherein the MI 2.16 is
from about 0.30 to about 5.0.

22. The modified polyethylene polymer of Claim 21 wherein the MI 2.16 is
25 from about 0.70 to about 3.0.

23. The modified polyethylene polymer of Claim 17 wherein the polyethylene
polymer is a Ziegler/Natta catalyzed polyethylene polymer.